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Acute and postacute sequelae associated with SARS-CoV-2 reinfection

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Abstract

First infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is associated with increased risk of acute and postacute death and sequelae in various organ systems. Whether reinfection adds to risks incurred after first infection is unclear. Here we used the US Department of Veterans Affairs' national healthcare database to build a cohort of individuals with one SARS-CoV-2 infection (n = 443,588), reinfection (two or more infections, n = 40,947) and a noninfected control (n = 5,334,729). We used inverse probability-weighted survival models to estimate risks and 6-month burdens of death, hospitalization and incident sequelae. Compared to no reinfection, reinfection contributed additional risks of death (hazard ratio (HR) = 2.17, 95% confidence intervals (CI) 1.93-2.45), hospitalization (HR = 3.32, 95% CI 3.13-3.51) and sequelae including pulmonary, cardiovascular, hematological, diabetes, gastrointestinal, kidney, mental health, musculoskeletal and neurological disorders. The risks were evident regardless of vaccination status. The risks were most pronounced in the acute phase but persisted in the postacute phase at 6 months. Compared to noninfected controls, cumulative risks and burdens of repeat infection increased according to the number of infections. Limitations included a cohort of mostly white males. The evidence shows that reinfection further increases risks of death, hospitalization and sequelae in multiple organ systems in the acute and postacute phase. Reducing overall burden of death and disease due to SARS-CoV-2 will require strategies for reinfection prevention.

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Figures

Fig. 1. Risk and burden of sequelae...

Fig. 2. Risk and burden of sequelae...

Fig. 3. Risk and burden of all-cause...

Fig. 4. Risk and burden of sequelae...

Fig. 5. Cumulative risk and burden of...

Extended Data Fig. 1
Cohort flowchart.

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